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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/281,990	03/29/1999	JOHN W. ELLING	99/097	7999

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EXAMINER

ZEMAN, MARY K

ART UNIT	PAPER NUMBER
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1631

DATE MAILED: 02/27/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/281,990

Applicant(s)

ELLING ET AL.

Examiner

Mary K Zeman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21, 39-61, 67 and 69-90 is/are pending in the application.
- 4a) Of the above claim(s) 1-21, 39-61 and 67 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 69-90 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application in accordance with the International Preliminary Report on Patentability (PCT Rule 17.2(a)).

* Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

- a) ☐ The translation of the foreign language provisional application has been received.

- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Information Disclosure Statement(s) (IDS) (PTO Form 1449, Paper(s))
- 2) ☐ Affidavit(s) (PTO Form 1449, Paper(s))
- 3) ☐ Information Disclosure Statement(s) (PTO Form 1449, Paper(s))
- 4) ☐ Affidavit(s) (PTO Form 1449, Paper(s))
- 5) ☐ Other

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DETAILED ACTION

The Art Unit location of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Art Unit 1631, Examiner Mary K Zeman. Claims 1-21, 39-61 and 67 stand withdrawn from consideration as being drawn to a non-elected invention, and should be canceled in response to this action.

Claims 69-90 are pending in this application and are examined herein.

Applicant's arguments with respect to claims 69-90 have been considered but are moot in view of the new ground(s) of rejection. Any rejection not repeated below has been withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 69, 72, 73-82, 84, 88, 89 and 90 are rejected under 35 U.S.C. 102(b) as being anticipated by Cramer (USP 5,307,287).

Cramer et al. (USP 5,307,287) disclose methods of defining molecular feature sets which correlate with a biological activity. Cramer discloses the Comparative molecular field analysis (CoMFA) which is a computer implemented QSAR program which identifies shapes and features of molecules that are likely to have a given activity. Cramer notes that the 3D-QSAR techniques are based upon the idea that it is possible to derive shape descriptors which when applied to substrates will reflect the different levels of the biological activity (column 3 lines 48-51). These are "molecular feature sets" that are "likely to be responsible for a given activity..."

The invention of Cramer et al. use descriptors of the shape measured activities of known compounds in a three-dimensional lattice data structure. The known molecules having the activity are used to generate equivalents to the "molecular substructure keys" of the claims. The molecules to be compared to the keys are grouped based upon their

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CoMFA interaction energies- which do not take into account the activity, per se. (columns 9-11) Then the groups or lattices are probed for common features and activities (columns 11-15), which can be output in a variety of ways (columns 15-17). Cramer et al. discuss the predictive power of the method to identify molecular structures which underly the activity, and generate new structures for testing (columns 17-19). Cramer sets forth computer programs, programmed computers, systems, media etc. (columns 19-22 and appendix) As such, Cramer et al. meets the limitations of the rejected claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 70, 71, 86 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cramer et al. as applied to claims 69, 72, 73-82, 84, 88, 89 and 90 above, in view of van Osdol (1994- PTO-1449).

The above rejected claims add the limitation that clustering of groups is performed by self organizing maps.

As set forth above, Cramer et al. (USP 5,307,287) disclose methods of defining molecular feature sets which correlate with a biological activity. Cramer discloses the Comparative molecular field analysis (CoMFA) which is a computer implemented QSAR program which identifies shapes and features of molecules that are likely to have a given activity. Cramer notes that the 3D-QSAR techniques are based upon the idea that it is possible to predict the biological activity of a molecule applied to substrates will reflect the different levels of the molecule's interaction with the substrates. Cramer et al. use descriptors of the shape of the molecule derived from steric and electrostatic interactions, interaction energies, and measured activities of known compounds in a 3

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dimensional lattice data structure. The known molecules having the activity are used to generate equivalents to the "molecular substructure keys" of the claims. The molecules to be compared to the keys are grouped based upon their CoMFA interaction energies- which do not take into account the activity, per se. (columns 9-11) Then the groups or lattices are probed for common features and activities (columns 11-15), which can be output in a variety of ways (columns 15-17). Cramer et al. discuss the predictive power of the method to identify molecular structures which underly the activity, and generate new structures for testing (columns 17-19). Cramer sets forth computer programs, programmed computers, systems, media etc. (columns 19-22 and appendix)

Cramer et al. do not teach clustering of identified features or groups using self-organizing maps.

Van Osdol et al. (Journal of the National Cancer Institute vol. 86, no. 24, pages 1853-1859, 1994- PTO-1449) disclose the usefulness of the self organizing map in the grouping of molecules based upon their topology and activity. The SOM captures topologic features (analogous to shape descriptors of Cramer and molecular feature sets of the instant claims) and represents those features in two dimensions. These methods allow for the clustering of similar chemical structures which have similar levels of biological activity. After training, the grouping is done in an unsupervised manner, which is superior to the supervised grouping of Cramer et al.

One of ordinary skill in the art at the time the invention was made would have been motivated to use the grouping functions of the self organizing map algorithms of van Osdol, as once the system/ network is trained, the grouping and clustering can proceed unsupervised, which is clearly an advance over the supervised grouping of Cramer et al. From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole is prima facie obvious to one of ordinary skill in the art at the time the invention was made, as

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Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary K Zeman whose telephone number is (703) 305-7133.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, can be reached at (703) 308-4028.

Official fax numbers for this Art Unit are: (703) 308-4242, (703) 872-9306. An *unofficial* fax number, direct to the Examiner is (703) 746 5279. Please call prior to use of this number.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC1600 Receptionist whose telephone number is (703) 308-0196.

mkz

2/21/03

MAK ZEMAN
PRINCIPAL EXAMINER

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